Cognitive Risk and Protective Factors in Dementia

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Overview

• Background to the study - In MINDD (FP7 project)

• Aims
  1) Identify cognitive dementia risk factors
  2) Identify cognitive protective factors against developing dementia
  3) Develop and validate a model of cognitive reserve (CR) based on risk and protective factors

• Methodology: Dual approach
  1) Meta-analyses of cognitive inactivity/activity as risk and protective factors respectively
  2) Development of CR model in MAAS data AND validate CR model in DESCRIPA data
IN MINDD

• INnovative, Midlife INtervention for Dementia Deterrence (INMINDD)

• Measurable and modifiable risk factors in middle age have a profound impact on the risk and/or onset of dementia in the over-70s
Risk and protective factors in dementia

Protective factors
- Exercise
- Healthy diet
- Cognitive activity
- Social health

Risk factors
- Alcohol
- Smoking
- Obesity
- Low mood
- Stress
- Sleep problems
- High Blood pressure
- High cholesterol
INMINDD WP1 – Risk Prediction Algorithm

• Aims:
  – Identify major modifiable risk factors for dementia by:
    • Systematic review of existing literature
    • International Delphi expert consensus
  – Develop personalised risk factor profile to predict individual risk of developing dementia
  – Predict the impact of modifying the risk factors
Ph D WP1 - Cognitive Risk Factors

• To date, 1st Delphi round has been conducted (INMINDD)

• Finding: Low cognitive activity ranked as a modifiable risk factor in cognitive decline -> relative risk (RR) of low cognitive activity remains unknown

• AIM: Conduct meta-analyses of cognitive inactivity/activity as risk and protective factors respectively
Methodology

• Dual approach: Meta-analyses (part 1) and validation of risk and protective model (part 2)

• Overview:
Part 2: Protection - A model of CR

• Models of cognitive reserve have proved wanting because of the lack of evidence to address the issue of construct validity

• Satz et al. (2011) propose a four-factor conceptual model of reserve that is
  (a) derived from the current extant literature
  (b) empirically testable
4-Factor Model

Executive Function (EF)
- Response inhibition
- Fluency
- Error Monitoring
- Selective attention
- Cognitive switching
- Verbal/nonverbal reasoning

Processing Resources (PR)
- Divided Attention
- Processing Speed
- Working memory

Complex Mental Activity (CMA)
- Lifetime/current mental activity
- Social networks
- Occupation
- Literacy
- Education

Intelligence “g”
- Crystallized IQ
- Fluid IQ

Satz et al. (2011)
Testing CR Model - MAAS data set

- The model will be developed on a large dataset of risk factors and cognitive decline/dementia outcomes – Maastricht Ageing Study (MAAS)

- 12-year follow-up study on cognitive ageing (N=1800, baseline)

- Model validation using DESCRIPA (N=880)
Testing CR Model

- **Proposed analyses:**
  - **Exploratory factor analysis**
    - to determine what groupings of indicators most effectively predicts variance observed in conversion to dementia
  - **Hypothesis testing of the model using confirmatory factor analysis or SEM**
    - to further elucidate the underlying structure of, and the relationships among, hypothesised constructs
Next Steps

• INMINDD has identified low cognitive activity as a major modifiable risk factor for dementia.
• This study aims to conduct exploratory meta-analyses of this risk factor to determine relative risk (RR).
• Meta-analyses will also be conducted to explore protective effects of cognitive activity.
• A model of cognitive reserve will be empirically tested to determine construct validity.
THANK YOU!

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